

**We Claim:**

1. A system for treating a thoracic cavity comprising

an ultrasound applicator adapted to be coupled to an electric signal generating machine to generate ultrasound energy, the ultrasound applicator being sized to be placed to the chest of an individual to transcutaneously apply ultrasound energy to the thoracic cavity, and

an agent administered to the individual to promote dissolution of thrombi before, during, or after application of the ultrasound energy, the agent being selected from a group consisting essentially of a thrombolytic agent, an anticoagulant, an antiplatelet drug, a fibrinolytic drug, or aspirin, or combinations thereof, or in combination with one or more thrombolytic agents, or microbubbles, or microparticles.

2. A system according to claim 1

further including an assembly worn on the chest and affixed to the ultrasound applicator, to stabilize placement of the ultrasound applicator on the chest during application of ultrasound energy to the thoracic cavity.

3. A system claim 2

wherein the assembly includes a quick release mechanism.

4. A system according to claim 2

wherein the assembly includes a quick release material.

5. A system according to claim 2

wherein the assembly comprises a sling worn between the waist and shoulders.

6. A system according to claim 2

wherein the assembly includes a halter worn about the chest and shoulders.

7. A system according to claim 2

wherein the assembly includes spaced apart members near the housing that allows another treatment device to be placed on the chest near the applicator.

8. A system according to claim 1

wherein the ultrasound applicator includes an ultrasound transducer to transcutaneously apply ultrasound energy to the thoracic cavity, the ultrasound transducer being sized to provide a power density not exceeding 3 watts/cm<sup>2</sup> at a maximum total power output of no greater than 200 watts operating at a fundamental therapeutic frequency not exceeding 500 kHz.

9. A system according to claim 1

wherein the ultrasound applicator includes an ultrasound transducer and a housing that includes a chamber to hold fluid about the ultrasound transducer.

10. A system according to claim 9

wherein the housing accommodates circulation of fluid about the ultrasound transducer.

11. A system according to claim 1

wherein the ultrasound applicator includes an ultrasound transducer and a housing carrying the ultrasound transducer that includes an ultrasound conducting interface.

12. A system according to claim 1

wherein the ultrasound applicator includes an ultrasound transducer and a housing carrying the ultrasound transducer that includes a contour-conforming interface with skin.

13. A system according to claim 1

wherein the ultrasound applicator includes an ultrasound transducer and a housing carrying the ultrasound transducer that includes a skirt that spaces the ultrasound transducer from contact with skin.

14. A system according to claim 1

wherein the ultrasound applicator includes an ultrasound transducer and a housing carrying the ultrasound transducer that includes an ultrasound-conducting membrane for contacting skin.

15. A system according to claim 1

wherein the ultrasound applicator includes an ultrasound transducer and a housing carrying the ultrasound transducer that includes a coupling assembly to releasably couple the ultrasound transducer to an external electric signal generating machine.

16. A system according to claim 15

wherein the coupling assembly includes a quick coupling mechanism.

17. A system for treating a thoracic cavity comprising

an ultrasound applicator adapted to be coupled to an electric signal generating machine to generate ultrasound energy, the ultrasound applicator being sized to be placed to the chest of the individual to transcutaneously apply ultrasound energy to the thoracic cavity,

an assembly worn on the chest and affixed to the ultrasound applicator, to stabilize placement of the ultrasound applicator on the chest during application of ultrasound energy to the thoracic cavity, and

an agent administered to the individual to promote dissolution of thrombi before, during, or after application of the ultrasound energy.

18. A system according to claim 17

wherein the agent includes a thrombolytic agent.

19. A system according to claim 17

wherein the agent includes an anticoagulant.

20. A system according to claim 17

wherein the agent includes an antiplatelet

drug.

21. A system according to claim 17  
wherein the agent includes a fibrinolytic

drug.

22. A system according to claim 17  
wherein the agent includes aspirin.

23. A system according to claim 17

wherein the ultrasound applicator includes an  
ultrasound transducer sized to provide a power density  
not exceeding 3 watts/cm<sup>2</sup> at a maximum total power output  
of no greater than 200 watts operating at a fundamental  
therapeutic frequency not exceeding 500 kHz.

24. A system according to claim 17

wherein the assembly includes a quick release  
mechanism.

25. A system according to claim 17

wherein the assembly includes a quick release  
material.

26. A system according to claim 17

wherein the assembly comprises a sling worn  
between the waist and shoulders.

27. A system according to claim 17

wherein the assembly includes a halter worn  
about the chest and shoulders.

28. A system according to claim 17

wherein the assembly includes spaced apart  
members near the housing that allows another treatment  
device to be placed on the chest near the applicator.

29. A system according to claim 17

wherein the ultrasound applicator includes a  
ultrasound transducer and a housing carrying the  
ultrasound transducer, the housing including a chamber to  
hold fluid about the ultrasound transducer.

30. A system according to claim 29

wherein the housing accommodates circulation

of fluid about the ultrasound transducer.

31. A system according to claim 17

wherein the ultrasound applicator includes a  
ultrasound transducer and a housing carrying the  
ultrasound transducer, the housing including an  
ultrasound conducting interface.

32. A system according to claim 17

wherein the ultrasound applicator includes a  
ultrasound transducer and a housing carrying the  
ultrasound transducer, the housing including a contour-  
conforming interface with skin.

33. A system according to claim 17

wherein the ultrasound applicator includes a  
ultrasound transducer and a housing carrying the  
ultrasound transducer, the housing including a skirt that  
spaces the ultrasound transducer from contact with skin.

34. A system according to claim 17

wherein the ultrasound applicator includes a  
ultrasound transducer and a housing carrying the  
ultrasound transducer, the housing including an  
ultrasound-conducting membrane for contacting skin.

35. A system according to claim 17

wherein the ultrasound applicator includes a  
ultrasound transducer and a housing carrying the  
ultrasound transducer, the housing being elongated along  
the axis of the sternum.

36. A system according to claim 17

wherein the ultrasound applicator includes a  
ultrasound transducer and a housing carrying the  
ultrasound transducer, the housing including a coupling  
assembly to releasably couple the ultrasound transducer  
to an external electric signal generating machine.

37. A system according to claim 36

wherein the coupling assembly includes a quick  
coupling mechanism.

38. A system for treating the thoracic cavity  
5 of an individual while being transported comprising  
an electric signal generating machine sized to  
be transported with the individual,  
an ultrasound applicator adapted to be coupled  
to the electric signal generating machine to generate  
10 ultrasound energy, the ultrasound applicator being sized  
to be placed to the chest of the individual while being  
transported to transcutaneously apply ultrasound energy  
to the thoracic cavity, and  
15 an agent administered to the individual to  
promote dissolution of thrombi before, during, or after  
application of the ultrasound energy.

39. A system according to claim 38  
wherein the agent includes a thrombolytic  
agent.

40. A system according to claim 38  
wherein the agent includes an anticoagulant.

41. A system according to claim 38  
wherein the agent includes an antiplatelet  
drug.

42. A system according to claim 38  
wherein the agent includes a fibrinolytic  
drug.

43. A system according to claim 38  
wherein the agent includes aspirin.

44. A system according to claim 38  
wherein the ultrasound applicator includes an  
assembly worn on the chest and affixed to the ultrasound  
applicator, to stabilize placement of the ultrasound  
5 applicator on the chest during application of ultrasound  
energy to the thoracic cavity.

45. A system according to claim 44  
wherein the assembly includes a quick release  
mechanism.

46. A system according to claim 44 wherein the assembly includes a quick release material.

47. A system according to claim 44 wherein the assembly comprises a sling worn between the waist and shoulders.

48. A system according to claim 44 wherein the assembly includes a halter worn about the chest and shoulders.

49. A system according to claim 44 wherein the assembly includes spaced apart members that allows another treatment device to be placed on the chest near the ultrasound applicator.

50. A system according to claim 38 wherein the ultrasound applicator includes an ultrasound transducer to transcutaneously apply ultrasound energy to the thoracic cavity, the ultrasound transducer being sized to provide a power density not exceeding 3 watts/cm<sup>2</sup> at a maximum total power output of no greater than 200 watts operating at a fundamental therapeutic frequency not exceeding 500 kHz.

51. A system according to claim 38 wherein the electric signal generating machine is battery powered.

52. A system according to claim 38 wherein the ultrasound applicator includes an ultrasound transducer and a housing that includes a chamber to hold fluid about the ultrasound transducer.

53. A system according to claim 52 wherein the housing accommodates circulation of fluid about the ultrasound transducer.

54. A system according to claim 38 wherein the ultrasound applicator includes an ultrasound transducer and a housing carrying the ultrasound transducer that includes an ultrasound

5 conducting interface.

55. A system according to claim 38

wherein the ultrasound applicator includes an ultrasound transducer and a housing carrying the ultrasound transducer that includes a contour-conforming interface with skin.

56. A system according to claim 38

wherein the ultrasound applicator includes an ultrasound transducer and a housing carrying the ultrasound transducer that includes a skirt that spaces the ultrasound transducer from contact with skin.

57. A system according to claim 38

wherein the ultrasound applicator includes an ultrasound transducer and a housing carrying the ultrasound transducer that includes an ultrasound-conducting membrane for contacting skin.

58. A system according to claim 38

wherein the ultrasound applicator includes an ultrasound transducer and a housing carrying the ultrasound transducer that includes a coupling assembly to releasably couple the ultrasound transducer to the external electric signal generating machine.

59. A system according to claim 58

wherein the coupling assembly includes a quick coupling mechanism.

60. A system according to claim 38

wherein the electric signal generating machine includes a controller to generate electrical signals to operate the ultrasound applicator during a treatment session to produce pulsed ultrasound energy.

61. A system according to claim 38

wherein the electric signal generating machine includes a controller to generate electrical signals to operate the ultrasound applicator during a treatment session to produce continuous ultrasound energy.



62. A system according to claim 38

wherein the electric signal generating machine includes a controller to generate different electrical signals to operate the ultrasound applicator during a treatment session to produce ultrasound energy in at least two different modes, each mode comprising a different frequency, or a different output power level, or both.

63. A system according to claim 62

wherein, in at least one of the modes, the controller generates pulsed electrical signals.

64. A system according to claim 62

wherein, in at least one of the modes, the controller generates continuous electrical signals.

65. A system according to claim 62

wherein, in at least one of the modes, the controller generates both pulsed and continuous electrical signals.

66. A system according to claim 65

wherein the controller generates both pulsed and continuous electrical signals in a prescribed sequence.

67. A system according to claim 65

wherein the controller generates both pulsed and continuous electrical signals in a random sequence.

5